

WHAT IS CLAIMED IS:

1. An article including a non-planar article surface and a coating on the article surface comprising a plurality of non-spherical particles each having a major dimension, an average of at least about 50% of the major dimensions being oriented generally along the article surface in respect to which the particle is disposed.
- 5 2. The article of claim 1 in which the particles are disposed in a coating on the article surface, the coating comprising a matrix about the particles.
3. The article of claim 2 in which:
the article surface is of a complex, three dimensional non-planar shape;
the matrix is non-metallic; and,
10 the coating comprises metallic flakes having an aspect ratio in the range of about 10 – 100 in the non-metallic matrix.
4. The article of claim 3 in the form of a component of a power generating apparatus.
5. The article of claim 3 in the form of a component of a vehicle.
- 15 6. The article of claim 3 in which the metallic flakes have an aspect ratio in the range of about 15 – 30.
7. The article of claim 3 in which the metallic flakes are magnetic.
- 20 8. A method using a magnetic field to orient with respect to an article surface a plurality of non-spherical particles each including a major dimension and each of which can be moved by a force applied to each particle, the particles being of a material which will react with a magnetic field, the particles being disposed in a fluid medium which will not react to a magnetic field and the viscosity of which can be increased, comprising the steps of:

providing substantially parallel relative movement between the magnetic field, and each particle and the article surface in respect to which each particle is disposed, while

5 disposing the magnetic field with its direction relative to the article surface so that, during the relative movement, the magnetic field will locate an average of at least about 50% of the major dimensions in a position generally along the article surface in respect to which each particle is disposed, as each particle passes through the magnetic field; and,

increasing the viscosity of the medium to secure each particle in the position.

10 9. The method of claim 8 in which:

the magnetic field is provided by disposing a magnet with a centerline of its N-S poles within about 30° of perpendicular to the article surface over which it is disposed and spaced apart from the particles at a distance, the magnet extending the magnetic field around the particles to apply to the particles a torque force capable of moving the particles in the fluid medium; and

15 with the magnet maintained substantially at the distance, providing the relative movement between the magnet and the particles.

10. The method of claim 9 in which:

the article surface is non-planar; and,
20 the magnet is carried at the distance as the relative movement between the magnet and the article surface substantially follows the non-planar article surface.

11. The method of claim 10 for providing a coating on a complex, three dimensional non-planar surface of a component of a power generating apparatus in which:

25 the magnetic field is in the range of about 100 - 1000 oersteds;
the distance is in the range of about ¼ - 1.5";
the particles are metallic, magnetic flakes having an aspect ratio in the range of about 10 – 100; and,
the fluid medium includes a curable polymeric material.

12. The method of claim 11 in which the magnetic flakes are a ferromagnetic material having an aspect ratio in the range of about 15 – 30.

13. A method for orienting with respect to an article surface a plurality of non-spherical particles each including a major dimension and each of which can be moved by a force applied to each particle, comprising the steps of:

5 disposing the particles in a fluid medium the viscosity of which can be increased;

applying a force to the medium carrying the particles to flow the medium substantially parallel to the article surface,

10 the medium applying a force on the particles sufficient to locate an average of at least about 50% of the plurality of particles with the major dimension in a position generally along the article surface in respect to which each particle is disposed; and,

increasing the viscosity of the medium to secure each particle in the position.

14. An article in the form of a sheet made by the method of claim 13.

15 15. An article made by the method of claim 13 comprising an article surface and a coating disposed on the article surface in which:

the fluid medium including the particles is disposed on the article surface; and, the force is applied to the medium to locate the particles in the position.

16. A method for orienting with respect to an article surface a plurality of non-spherical particles each including a major dimension and each of which can be moved by a force applied to each particle, comprising the steps of:

20 disposing the particles in a medium the viscosity of which can be increased, the medium being in a fluid condition;

disposing the medium with the particles on the article surface;

25 locating the article surface substantially perpendicular to a force of gravity;

maintaining the medium in the fluid condition for a time selected to enable the force of gravity to locate an average of at least about 50% of the plurality of particles with the major dimension in a position generally along the article surface in respect to which each particle is disposed; and,

increasing the viscosity of the medium to secure each particle in the position.

17. A method for orienting with respect to an article surface a plurality of non-spherical particles each including a major dimension and each of which can be moved by a force applied to each particle, comprising the steps of:

- 5 disposing the particles in a medium the viscosity of which can be increased; the medium being in a fluid condition with the viscosity selected to provide a selected surface tension in the medium;
- 10 disposing the medium with the particles on the article surface; and, maintaining the medium in the fluid condition for a time selected to enable the surface tension to located at least about 50% of the plurality of particles with the major dimension in a position generally along the article surface in respect to which each particle is disposed.

18. The method of claim 17 in which:

- 15 the medium with the particles is disposed in a coating of a plurality of superimposed layers on an article surface, each layer being maintained in the fluid condition for the time prior to disposition of a subsequent superimposed layer to enable a combination of gravity and surface tension to locate at least about 60% of the plurality of particles in the coating with the major dimension in the position.

- 20 19. The method of claim 18 in which each layer has a thickness in the range of about 0.008 – 0.012".